

SUPPORT FOR THE AMENDMENTS

Support for the amendment of Claim 1 (Rb) is found in Claim 15.

Claims 1-5, 6 and 8 are amended to use structure and wording consistent with U.S. patent law practice.

Claim 6 is amended to depend from Claim 1.

Claim 7 is canceled.

Support for the amendment of Claim 15 is found on page 30, lines 11-15, in the specification.

Claims 15-21 are amended to use structure and wording consistent with U.S. patent law practice.

Claims 17 and 19 are amended to describe a broader and narrower description of temperature range respectively.

Claims 27-33 are amended to use structure and wording consistent with U.S. patent law practice.

No new matter is believed added to this application by entry of this amendment.

Upon entry of this amendment, Claims 1-6 and 8-43 are active. Claims 9-14, 22-26 and 34-43 are withdrawn.

REMARKS/ARGUMENTS

The claimed invention is directed to compounds which are precursors for synthesizing specialty solid materials including, for example, high silica content zeolites, separation and adsorption agents, solid catalysts and ion exchange agents, the specialty materials prepared therefrom and methods for manufacturing the precursors and specialty materials. Precursors to novel specialty materials which are also novel, stable, low-cost and prepared by facile manufacturing methods are sought.

The claimed invention addresses this problem by providing the crystalline layered compounds described in Claim 1 and claims dependent thereon and the methods of manufacture described in Claims 6 and 15 and the claims dependent thereon, respectively. No such crystalline layered compounds are disclosed or suggested by the cited references.

The rejection of Claims 1-8 and 15-21 under 35 U.S.C. 102(b) over Kooli et al. (New Journal of Chemistry, "Novel layered silicate and microporous silica materials in the Na-magadiite-H₂O-(TMA)₂O system" New J. Chem., 2001, 25, 1613-1620 [Reference A]) is respectfully traversed.

Kooli describes a microporous silica material described as "FLS" prepared from a system of Na-magadiite, water and tetramethylammonium hydroxide (TMAOH).

The Office has alleged that "Since the XRD patterns of the prior art and the instant application are exactly the same in peak position and relative intensity, then it must also be true that the composition, bonding nature, and the lattice spacing associated with 2 theta of both materials are the same." (Official Action dated June 10, 2009, page 5, lines 1-4).

Applicants respectfully disagree and submit XRD can show only average structure of the materials, however, for example, it is impossible to know, for example, whether the covalent bonds of -Si-O-Si- are locally cleaved or not. Moreover, close comparison of the diffraction pattern of Table 1 of Claim 1 to the pattern of FLS in Table 1 of Reference A shows differences which are significant. For example the claimed compound shows moderate peaks at 7.34 and 7.00 d(Å) whereas the FLS does not. Other similar differences are apparent when the comparison is made. As the Office has indicated XRD is a measure of the lattice parameters of a crystalline material. However, XRD does not necessarily show small, but significant differences in chemical structure which can be demonstrated in other methods of analysis. Applicants respectfully submit that the crystalline layered compound (PLS-1)

defined in claim 1 of the instant application and FLS (magadiite) of Reference A (Kooli) are not the same.

With regard to FLS, Applicants submit in the IDS accompanying this Amendment another article by Kooli (Reference B), from Langmuir, Vol. 18, No. 10, 4103-4110, 2002, wherein the FLS compound is described as FLS1.

Applicants particularly note the following differences between PLS-1 and FLS/FLS1, and also CDS-1 and calcined FLS/FLS1:

1) Difference 1:

With regard to the spectra of ^{29}Si -MASNMR, the spectrum of PLS-1 is different from that of FLS/FLS1.

With regard to arbitral intensities of Q3 spectrum on -94~-107 ppm and Q4 spectrum on -107~-125 ppm, the spectra of PLS-1 and CDS-1 are different from that of FLS/FLS1,

In the case of PLS-1 demonstrated in Fig. 4 of the instant application, the arbitral intensity of Q3 spectrum of the PLS-1 is higher compared with that of FLS/FLS1 (shown by the arrows in Fig.5 in Reference A and Fig.5 in the Reference B), which are evidences showing the amounts of Si-OH on the surface of crystals of these materials are distinctly different.

As shown in Fig. 5d, e in the Reference B, calcined FLS 1 shows a apparent shoulder peak in Q3 region (-94~-107 ppm)(shown by the arrow), which means that the skeleton of FLS1 has a structure, wherein (SiO_4) Si groups thereof are partially not closed, and has many Si-OH groups present. This shows an essential difference between the skeleton of FLS1 and the skeleton of CDS-1.

The CDS-1 material containing many-OH groups is more hydrophilic in comparison to PLS-1 which contains less-OH groups and is therefore more hydrophobic. This difference in

hydrophilic properties clearly shows that PLS-1 as claimed is distinctly different from the material described by Kooli.

Fig.5 in Reference A

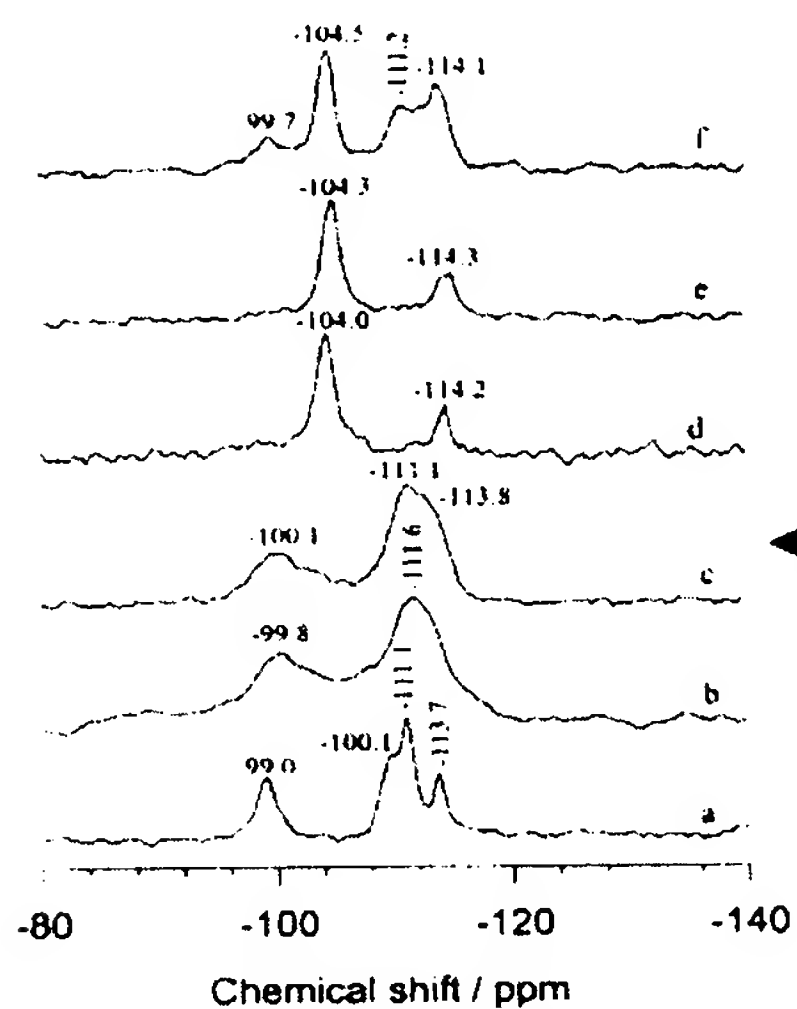


Fig. 5 ^{29}Si MAS NMR spectra of (a) Na-magadiite and (b-f) resulting phases obtained after reaction at 150°C for different times. See Fig. 2 for details.

Fig.5 in Reference B

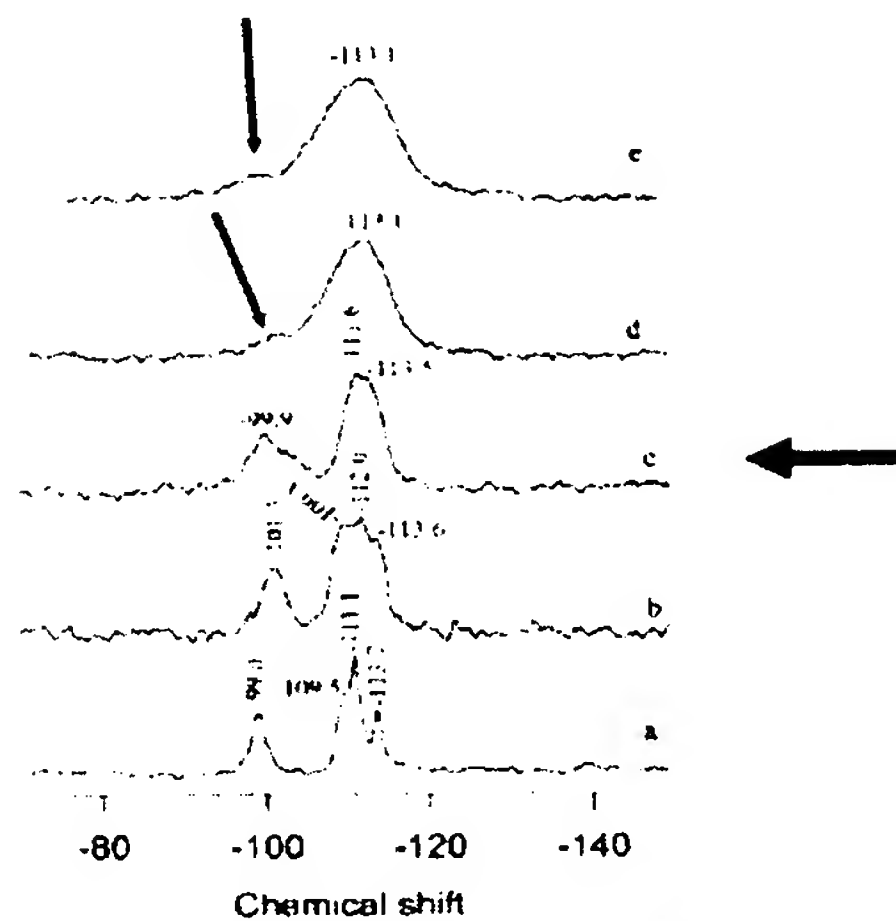
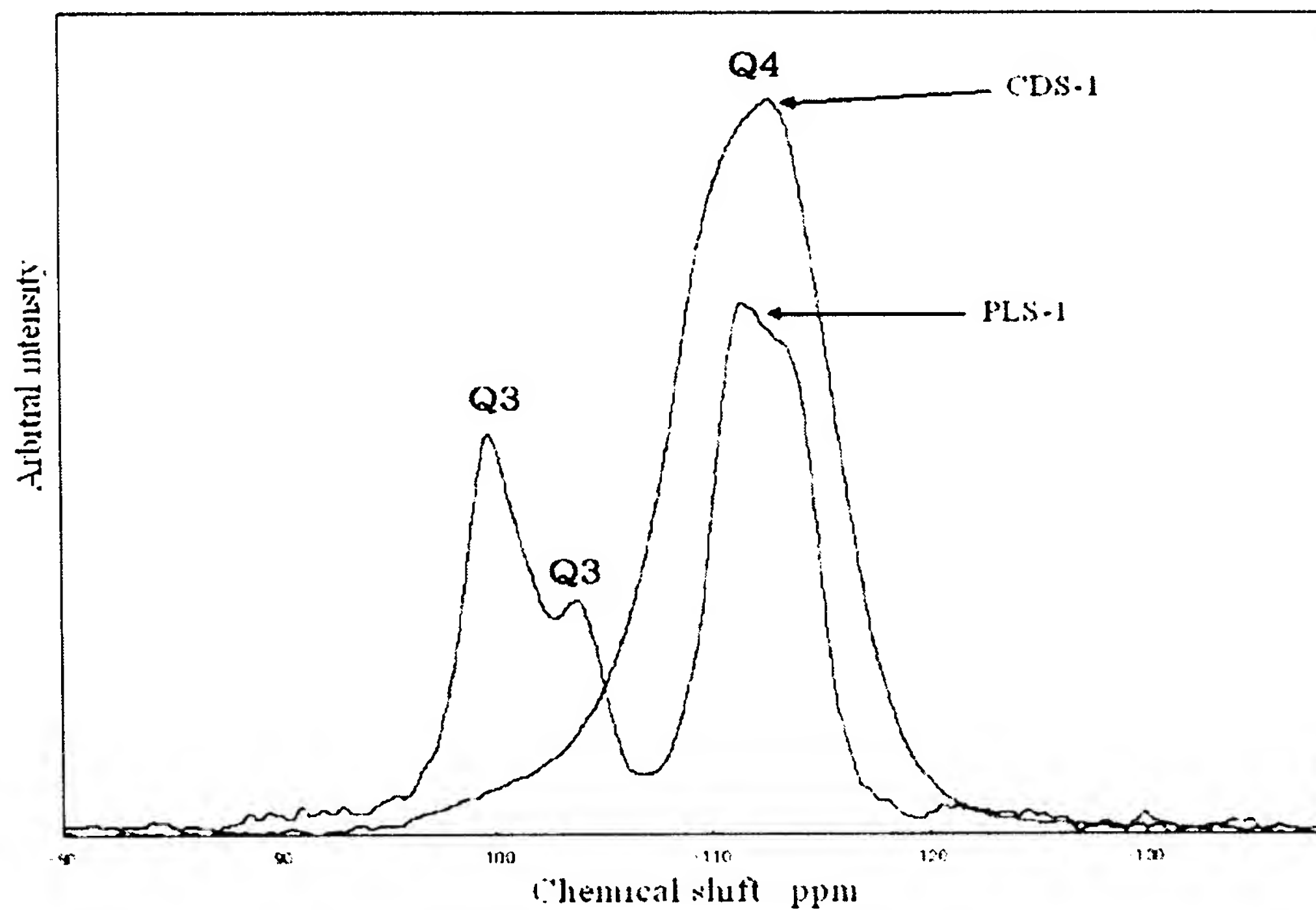


Figure 5. ^{29}Si MAS NMR of (a) Na-magadiite and (b) H-magadiite. Spectrum c corresponds to the FLS1 phase prepared at 150 °C for 5 days, then calcined at (d) 500 and (e) 700 °C.

^{29}Si MAS-NMR spectra of PLS-1 and CDS-1 (Fig.4 in this application)



2) Difference 2:

In the Reference B, as a evidence for proving the calcined FLS-1 is macroporous material, the average pore size is analyzed by nitrogen adsorption method, and it is determined that the average pore size of calcined FLS-1 is 0.88nm as shown in Fig. 10 in Reference B.

In contrast, the average pore size of the CDS-1 is 0.48nm (the first peak) and the second peak shows only 0.64nm, as shown in Fig. 8 in the specification.

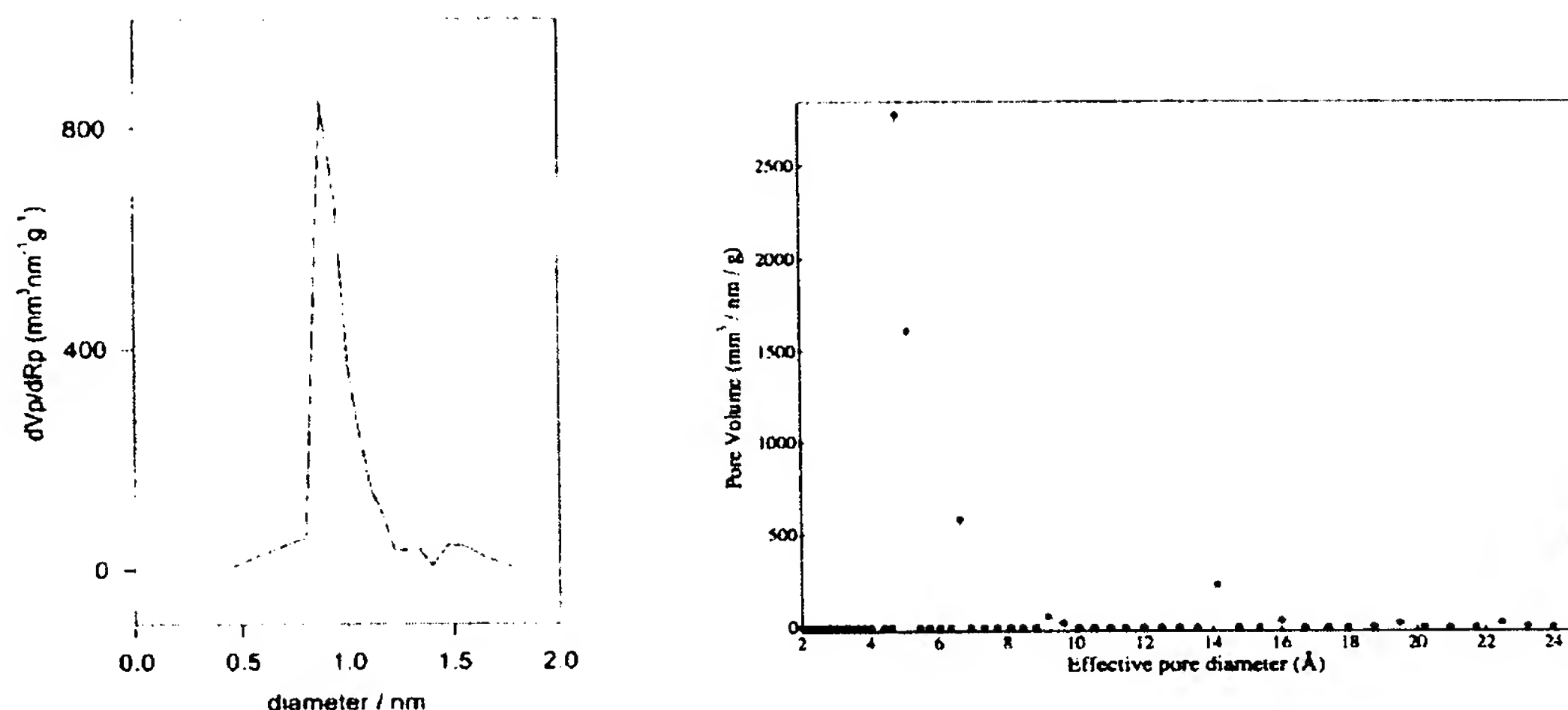


Figure 10. Pore size distribution of FLS1 calcined at 500 °C. using the MP method.

Fig.10 in Reference B CDS-1 (Fig.8 in this application)

The crystal structure of CDS-1 is shown in Fig. 9 in the specification and is further described in our publication (Angew. Chem Int. Ed. 2004, 43, 4892-4896: Reference C)(submitted by IDS herewith).

The pore size of the calcined FLS-1 is apparently larger than the pore size of the CDS-1, which is 0.47nm as maximum pore size that is calculated from the crystal structure shown in Reference C.

The crystal structure of the CDS-1 is registered as the topology of CDO (CDS-One) by International Zeolite Association (IZA), wherein the maximum pore size of the CDS-1 is described as 0.47nm(Reference: Atlas of Zeolite Framework Types, 6th revised edition, 2007, Ch. Baerlocher, W. M. Meier and D. H. Olson, ISBN: 978-0-444-53064-6).

Further, with regard to the pore volume from nitrogen adsorption isotherms, the pore volume of the CDS-1 is calculated to be 0.6ml/g demonstrated in the Reference C, but the pore volume of the calcined FLS1 is ≤ 0.317 ml/g as demonstrated in Table 1 in Reference B.

Table 1. Surface Areas of FLS1 Calcined at Different Temperatures Calculated Using the BET Equation^a

sample	S_{BET} ($\text{m}^2 \text{g}^{-1}$)	C_{BET}	corr coef	pore vol ^c
H-magadlite	40	137	0.999 98	
FLS1	90	128	0.999 85	0.141
FLS1(300) ^b	120	-316	0.999 46	0.114
FLS1(400)	306	-189	0.999 39	0.212
FLS1(500)	436	-180	0.999 68	0.317
FLS1(700)	307	-106	0.999 55	0.205
FLS1(800)	270	-134	0.999 58	0.181
FLS1(900)	95	282	0.999 88	0.115

^a The corresponding CBET and correlation coefficients are also reported. ^b Values in parentheses indicate the calcination temperatures ($^{\circ}\text{C}$). ^c mL (liquid nitrogen) g^{-1} .

Table 1 in Reference B

In view of the above, Applicants submit that PLS-1 is different from FLS/FLS 1, and that CDS-1 is different from the calcined FLS/FLS1.

Applicants respectfully submit that a proper finding of anticipation requires that “[e]very element of the claimed invention ... be literally present, arranged as in the claim. *Perkin-Elmer Corp.*, 732 F.2d at 894, 221 USPQ at 673; *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771-72, 218 USPQ 781, 789 (Fed. Cir. 1983), *cert. denied*, 465 U.S. 1026 [224 USPQ 520] (1984). The identical invention must be described in as complete detail in the reference as is described in the claimed invention.

In view of all the above, Applicants respectfully submit that the reference does not describe the claimed invention and therefore cannot anticipate the claimed invention. Applicants respectfully request that the rejection of Claims 1-8 and 15-21 under 35 U.S.C. 102(b) over Kooli et al. (New Journal of Chemistry, “Novel layered silicate and microporous silica materials in the Na-magadiite- H_2O -(TMA) $_2\text{O}$ system” New J. Chem., 2001, 25, 1613-1620 [Reference A]) be withdrawn.

The rejection of Claims 27-33 under 35 U.S.C. 103(a) over Kooli in view of Deckman et al. (U.S. 7,049,259) is respectfully traversed.

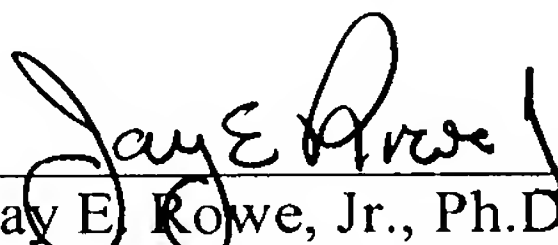
Applicants have described above that the primary reference does not disclose or suggest the PLS or CDS-1 materials of the claimed invention. Deckman is cited to show incorporation of zeolites into an inorganic membrane supported by porous glass, sintered steel, α -alumina and other inorganic oxides. (Official Action dated June 10, 2009, page 9, lines 10-13)

Deckman describes a method to prepare a structure of layers of molecular sieve material on a porous or non-porous support. This secondary reference does not disclose or suggest the PLS and CDS-1 materials according to the claimed invention and therefore does not cure the basic deficiency of the primary reference. Accordingly, the cited reference combination cannot render the invention according to Claims 27-33 obvious and Applicants respectfully request that the rejection of Claims 27-33 under 35 U.S.C. 103(a) over Kooli in view of Deckman be withdrawn.

Applicants respectfully submit that the above-identified application is now in condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

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